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6 February 1961

MEMORANDUM FOR: Director, Photographic Intelligence Center
Deputy Director, Photographic Intelligence Center

SUBJECT : Summary of the Current Development Plan

1. The PI Cell

The first phase of the development of the PI Cell is complete with the termination of [] contract. I have received several letters from Division Chiefs stating their various disenchantments with the contractor. Unfortunately, the contractor got a mental visage about half way through the project which was to design only for those components for which he could provide. However, though he presented a biased final report and a rather poor mock-up of his concept of a PI Cell, I feel that a great deal was learned by the PIC Technical Development Board by having gone through this exercise.

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The total project was only for [] and when this amount was split four ways, and because of the amount of travel necessary to prosecute the project, especially during the orientation of the contractors, I feel that we got about as much out of this exercise as was possible. For instance, at last the idea of group viewing is a realizable goal within the Center and the orientation of the PI's to fairly sophisticated, automated systems is much more feasible now than before the contract. Unfortunately, some of the contract participants were unable, because of the prime contractor's restraints, to express themselves freely in their concepts. Still we achieved the knowledge throughout the Center that such a change from the way that we did PI in 1959 and the way we must do PI in 1962 - 1965 is real.

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It is impossible to disagree violently with the method of the idea a company puts forth unless you have a pretty good idea yourself what the concept is that you disagree with. This means that at least the Division Chiefs have some idea of what they will accept now. It has also had a secondary affect on the Chairman in the fact that I have had to try much harder to define the engineering aspects and to simplify the system in such a manner that it has an achievable goal. I have recently discussed with []

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the human factors which are the basis of the engineering that must go into the PI Cell. Because, after all, what we are really trying to achieve in this cell is the optimization of these humans in reading a product which is beyond their physical limitations without fairly sophisticated equipment. At present we are working hard to solidify the engineering parameters that must go into the cell concept as we visualize it today.

[] came along sometime after the Phase 1 of the PI Cell development plan had started. I believe the reason for inventing such a system came directly from the fact that the original concept was far too complex to be a practical, realistic goal. By having had to explain and describe the Center, its working materials, its instrumentation, and its modus operandi, we get a better realization ourselves of exactly what our problems are. The automation concept for PIC was also derived from having had to describe what we believed the system of tomorrow and its problems would be time and time again. The continuing fight to define these problems in realistic terms of future inputs engenders the ideas which will lead to the resolving of these problems.

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2. Photo Lab

The new concept concerning the Photo Lab with which [] and I are in fair agreement, is that in the future there must be two distinctly separate areas for handling inputs. This is especially true when you consider the inputs to be 150 - 200 plus 1/mm. These high acuity materials will require environment, techniques, equipment, and procedures which are now only realizable in a manual, surgical, experimental, piece-meal arrangement. The new concept separates the Photo Lab activities into two separate areas. Area 1 will be that place where original negative materials will be handled to perform the quality reduction. By quality reduction I meant that today with our on-the-line equipment we are capable of handling in volume 60 - 80 1/mm material in a careful, knowledgeable, but clean dairybarn-type arrangement.

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We have only a few pieces of equipment capable of handling 150 - 200 1/mm. The very nature of this equipment is epitomized in the 20X Enlarger designed specifically to be in a dust-free, controlled environment, out white-gloving the Air Force white-gloves concept.

In order to arrive at a feasible concept for future operations concerning the Photo Lab, one basic decision had to be made. In concert with the [] concept this decision was -- when you have a high quality input (150 - 200 1/mm), a trade-off of volume at lower resolution for the compact,

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high quality material is necessary. By this I mean an optical transfer from 200 l/mm to about 50 l/mm onto 4 times the area would make the high quality material into a form in which it could be handled in a more conventional fashion. The Photo Lab would then be broken into 2 major areas. The first area which would be designed to handle the original negative at high acuity and the attendant equipment to reduce this to a higher volume of lower quality material. The equipment I visualize in this laboratory would be the extremely expensive and sensitive equipment needed to achieve the information transfer without loss. In this area we would make every effort to create the environment and surgical conditions mentioned above. The second area would be the clean, dairybarn production arrangement for handling the lower quality, high volume outputs of the first area.

A high resolution laboratory would need about 20% of the Lab's total work force and would require them to be highly skilled in photo technology. The lower resolution Lab capability is where you can concentrate the 80% of the effort. These people need not be Photo Technologists. These people, when properly supervised can do the backup job that they have been doing these many years. This plan is so simple it seems almost trite, but I am sure that it will work.

3. PI Equipment

We have created a broad base of fairly high-quality equipment to exploit film containing between 60 - 100 l/mm. This has cost the Center nearly [redacted] Its tenure on board ranges from 1 to 4 years. I cannot make myself believe that this equipment can become out-dated by the input product of anew system overnight. The human factors and engineering parameters in most of this equipment are sound and have proved themselves in actual operation in the Center and under this new concept will have utility for many years ahead.

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The basic parameters for converting photo images under which the equipment we have on board now was developed are still correct, but these must be extended now to embrace the new systems which we will be working with in the future. The main change will be in the volume of the high quality materials which we must handle and this is the reason for the PI Cell. Many of the scanning and MCI operations, as they are to be done within the time limitations required, must be automated to their highest extent. However, for detailed work, which is an individual operation for the most part, I don't visualize changing much of the instrumentation that we have on board. However, the major portion of detailed analysis is on an individual basis and the real emphasis for which our PI Cells and [redacted] and advanced Laboratory concepts are aimed are for the group analysis which occurs during

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the scanning operation through the mission coverage index, and it may extend only to reviewing the pertinent photography for joint detailed exploitation.

4. Other Pertinent Aspects

There are several other areas in which concurrent development must take place in order for the programs that I have outlined to be effective and these are: the automation program, photo mensuration sub-system, and training. In the automation program there is a fairly clear cut automation concept which we will implement as we receive reports from [] indicating feasibility and equipment recommendations to accomplish the tasks. The Photo mensuration sub-system is under active up-dating to handle high acuity materials on a high productivity capability, and the new building facilities are outside the perview of this report.

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5. Problems

a. There are some problems attendant to becoming the National Photographic Interpretation Center which are pertinent to this report. These problems lie mainly in the receipt of literally hundreds of pounds of proposals for advanced systems which have been pouring in since the word has gotten out. This causes a tremendous work load on the reviewing people.

b. As soon as it is possible we need answers on such questions as: How many people are we planning to implement for; how much money do we have for this implementation; and how much space and where should these things be accomplished? It will probably be sometime before these questions can be answered. Meanwhile, we are continuing on our last instructions.

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